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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/809,287 | 03/24/2004 | Michael S.Y. Wong | ATH-003-1P | 6055 |

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EXAMINER

PEREZ, JULIO R

ART UNIT

PAPER NUMBER

2617

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
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Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

| | | | |
|------------------------------|-------------------------------|-----------------------------|--|
| Office Action Summary | Application No. 10/809,287 | Applicant(s) WONG ET AL. | |
| | Examiner Julio R. Perez | Art Unit 2617 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 8-11, 13-15, 17-26, 29-32, 34-36, 38 and 39 is/are rejected.
- 7) ☒ Claim(s) 6, 7, 12, 16, 27, 28, 33 and 37 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>10/23/006</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-5, 8-11, 13, 14, 15, 17, 18, 22-26, 29-32, 34-36, 38-39, are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's submission of prior art Sindhushayana et al. (US006760313B1) in view of applicant's submission of prior art Hamalainen (US 20030021243A1).

Regarding claims 1, 22, Sindhushayana teaches a method of determining a transmission rate (TxRate) for a WLAN transmitter, the method including: determining one or more valid data rates, wherein a valid data rate has an RSSI threshold less than or equal to the lookup RSSI (col. 11, lines 16-32. Note that col. 11, lines 25-32 teaches selecting data rates based on the SINR received, which reads on determining valid data rates); computing an achievable user throughput for each valid data rate based on a theoretical rate and 1 minus a packet error rate (col. 6, lines 59-67, col. 7, lines 1-16, 36-41, col. 10, 64-67, col. 11, lines 1-32, teach consulting a table of SINRs for selecting an appropriate data rate, which is based on a threshold for correct detection being lower and adjacent to a predicted, i.e., "theoretical", for a given probability of error, which read on the computation of an achievable throughput); and choosing the valid data rate having the highest achievable user throughput as the TxRate (col. 11, lines 5-24, teach

the selection of the best data rate at which a PER of packets received will not exceed the target PER), but is silent on determining a lookup received signal strength indicator from one or more acknowledgement (ACK) packets.

Hamalainen teaches selections of signals based on analyzing feedback signals to include acknowledgements for receiving packets (par. 37, a more robust MCS would be selected if a certain number of successive NACK commands are used and thus a higher rate would be selected if successive ACK command are issued).

It would have been obvious to one of skilled in the art at the time of the invention to modify Sindhushayana to include selecting signal strengths associated to packets to provide the most optimal data rate based on communication conditions.

Regarding claims 2, 23, the combination of Sindhushayana and Hamalainen teaches claim 1, wherein determining the lookup RSSI includes determining a median value of RSSIs from three ACK packets (Sindhushayana, col. 11, lines 5-32).

Regarding claims 3, 24, the combination of Sindhushayana and Hamalainen teaches claim 1, wherein computing the achievable user throughput includes computing a product of the theoretical rate and the 1 minus PER (Sindhushayana, col. 7, lines 36-41, col. 8, lines 29-48).

Regarding claims 4, 25, the combination of Sindhushayana and Hamalainen teaches, further including: determining if a size of a frame to be transmitted is greater than a predetermined value; and if the size is greater, then reducing the lookup RSSI by a predetermined amount before determining valid data rates (Sindhushayana, col. 6, lines 10-29 teach selecting second data rate to optimum data rate wherein transmitting

data to destination only at the rate indicated by the most recent message based on frame length).

Regarding claims 5, 26, the combination of Sindhushayana and Hamalainen teaches claim 1, further biasing the lookup RSSI based on age before determining valid data rates, wherein an older lookup RSSI is reduced more than a more recent lookup RSSI (Sindhushayana, col. 9, lines 2-5 teach biases for making decisions for lower throughput to be removed).

Regarding claims 8, 9, 29, 30, the combination of Sindhushayana and Hamalainen teaches claim 1, further including updating a rate control table based on a number of retries to successfully transmit a packet at the TxRate (Sindhushayana, col. 11, 16-32).

Regarding claims 10, 31, the combination of Sindhushayana and Hamalainen teaches claim 1, wherein updating the rate control table is further based on whether the TxRate is a probe rate (Sindhushayana, col. 11, 5-25).

Regarding claims 11, 32, the combination of Sindhushayana and Hamalainen teaches claim 1, wherein if excessive retries are performed, then updating the rate control table includes adjusting the PER and the RSSI threshold of the TxRate (Sindhushayana, col. 11, lines 1-24).

Regarding claims 13, 34, the combination of Sindhushayana and Hamalainen teaches claim 1, wherein if excessive retries are not performed, then updating the rate control table include computing the PER of the TxRate based on the number of retries (Sindhushayana, col. 11, lines 25-49).

Regarding claims 14, 35, the combination of Sindhushayana and Hamalainen teaches claim 1, wherein if the TxRate is a probe rate and has few retries, then resetting the PER of the TxRate; significantly reducing a probe interval; and setting maxRate to the probe rate (Sindhushayana, col. 11, lines 1-42).

Regarding claims 15, 36, the combination of Sindhushayana and Hamalainen teaches claim 1, wherein if the TxRate is not probe rate and has no retries on a predetermined number of packets sent at TxRate, then reducing the RSSI threshold of the TxRate (Sindhushayana, col. 11, lines 1-56).

Regarding claims 17, 38, the combination of Sindhushayana and Hamalainen teaches claim 1, wherein updating the rate control table includes periodically aging values (Sindhushayana, col. 9, lines 2-15).

Regarding claims 18, 39, the combination of Sindhushayana and Hamalainen teaches claim 1, wherein aging values includes: reducing RSSI thresholds by a predetermined amount; and reducing PERs by a predetermined factor (col. 9, lines 2-5 teach biases for making decisions for lower throughput to be removed).

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) The invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 19-21 are rejected under 35 U.S.C. 102(e) as being anticipated by Sindhushayana et al. (US 6,760,313).

Regarding claim 19, Sindhushayana discloses a transmission rate for a packet (col. 7, lines 36-38 "upon request from an MS for a packet at a certain rate, the MS detects a request for transmitting packets", where the packet is sent over a channel), the transmission rate being computed based on a received signal strength indicator (RSSI) of one or more packets (col. 11, lines 5-24, teach the selection of the best data rate at which a PER of packets received will not exceed the target PER), RSSI thresholds of possible data rates (col. 8, lines 29-45, teaches RSSI with thresholds), theoretical rate values of the possible data rates, and packet error rates (PERs) of the possible data rates (col. 6, lines 59-67, col. 7, lines 1-16, 36-41, col. 10, 64-67, col. 11, lines 1-32, teach consulting a table of SINRs for selecting an appropriate data rate, which is based on a threshold for correct detection being lower and adjacent to a predicted, i.e., "theoretical", for a given probability of error, which read on the computation of an achievable throughput).

Regarding claim 20, Sindhushayana discloses the transmission rate being further computed based on a size of a frame to be transmitted (col. 6, lines 10-29 teach selecting second data rate to optimum data rate wherein transmitting data to destination only at the rate indicated by the most recent message based on frame length).

Regarding claim 21, Sindhushayana discloses the transmission rate being further computed based on an age of the multiple acknowledgement packets (col. 9, lines 2-5

teach biases for making decisions for lower throughput to be removed, which are based as well on expired ACKs).

Allowable Subject Matter


5. Claims 6, 7, 12, 16, 27, 28, 33, 37 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter: The cited prior art teaches usage of values of the first and second rates such that a throughput of the HDR system is maximized and the target PER is achieved. On the other hand, the applicant's application teaches transmission rate for determining the optimal data rate which is greater than a maximum data rate to include if the TxRate is greater than the maxRate and determining whether a probe rate is successful in order for resetting the TxRate to one rate higher than the maxRate, and wherein if is not successful, resetting the TxRate to the maxRate. In addition, therein if the TxRate is not a probe rate and the PER is greater than a defined value, ensuring the data rates above the TxRate require higher RSSI thresholds than that of the TxRate and that the data rates below the TxRate require lower RSSI thresholds than the TxRate as well as PERs less than or equal to the PER of the Txrate. These limitations, have not been disclosed, taught, or made obvious over the prior art of record.

Conclusion


6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julio R. Perez whose telephone number is (571) 272-7846. The examiner can normally be reached on 10:30 - 6:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William H. Trost can be reached on (571) 272-7872. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


3/19/07

Julio R Perez
Examiner
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